

CLAIM

I claim:

1. A phone secretarial function extension device for a hand-free set comprising a wired or wireless remote controller, a receiver and an I/O (input/output) interface that are used to couple a hand-free set to a cellular phone;

wherein said wired or wireless remote controller is a freely portable unit having an interior in which remote control circuits are housed, said circuits are actuated to transmit remote control signals therefrom to said receiver as externally disposed buttons on said remote controller are pressed; an end of said receiver is coupled to said hand free set of a cellular phone and the opposite end thereof is connected to a terminal of said I/O interface; in said receiver are disposed remote control signals receiving and processing circuits and a dialing circuit that are remotely actuated by said wired or wireless remote control to make a dial; one terminal of said I/O interface is coupled to said receiver and the other terminal is coupled to a signal terminal of said cellular phone whereby said receiver and a plurality of connection lines of said terminal of said cellular phone are integrally connected by way of said I/O interface.

2. The phone secretarial function extension device for a hand-free set as claimed in claim 1 wherein said wired or wireless remote controller comprises:

a chief remote control unit being used to chiefly control and coordinate individual components of said wired or wireless controller to operate;

10004405 " 120501

a power supply processing unit being coupled to an external power source to raise or lower the voltage thereof or adjust the same so as to supply working voltages to individual components of said wired or wireless controller in operation;

said external power source supplying a working voltage to said wired or wireless controller;

a light detecting and light transmitting control unit being subject to the control of said chief remote control unit to direct operation of a light generating circuit;

said light generating circuit being hidden under a button matrix of a man-to-machine interface, or mounted somewhere to an external case of said wired or wireless controller to produce light of indication;

a signal transmission control unit converting codes of a dial coding unit into infrared signals and controlling a signal emitting unit to transmit dialing codes of said dial coding unit in an infrared form;

a signal transmitting unit of an infrared generator being subject to the control of said signal transmission control unit to transmit phone numbers converted into coded signals by said dial coding unit in an infrared form;

said dial coding unit being subject to the control of said chief remote control unit to get a phone number in said data storage unit coded and send out the coded phone number by said signal transmitting unit in an infrared form;

a digital signal processing unit (voice identifying unit) processing signals transmitted from

an AD/DA conversion unit to identify if said signals are useful or related voice instructions; or processing control signals transmitted from said AD/DA conversion unit and said chief remote control unit to further control input and output of said AD/DA conversion unit or input and output of said data storage unit;

said AD/DA conversion unit transforming analog signals from a microphone into digital ones for the use of said digital signal processing unit (voice identifying unit) and being controlled by said digital signal processing unit (voice identifying unit) to output voice data stored in a data storage unit in phonic sound via speakers or corresponding circuit;

said data storage unit being used for storing a phone directory, corresponding prompts for a man-to-machine interface(0-9, recording, playing....and functional terms of the like), contents of communication, pre-recorded phonic guidance of said phone directory and various data bases, and also for temporary storing signals of said man-to-machine interface for batch processing;

a man-to-machine interface control circuit being subject to coordination of said chief remote control unit to direct the operation of a plurality of buttons or the activation of a control operation and to receive signals transmitted from a man-to-machine interface for the use of said chief remote control unit or for setting a wired or wireless remote controller;

said man-to-machine interface being a pressing button matrix including buttons, (such as digits of 0-9,*, #, recording, playing, augment, correction, end, SEND), a turning knob, a

turn table for a user to input setting parameters;

a microphone amplifying circuit being used to process phonic signals transmitted from a microphone by amplifying the same or other operations on compensating loss of fidelity;

a microphone for inputting phonic instructions;

a speaker control and amplifying circuit being subject to the control of said AD/DA conversion unit to process voice signals and output the same via a speaker;

said speaker being used for outputting voice signals;

3. The phone secretarial function extension device for a hand-free set as claimed in claim 1 wherein said receiver comprises:

a chief receiving control unit being used to dominate and coordinate operations of all units of said receiver;

a charging and power processing unit operating in cooperation with a power input and charging control of a hand-free set to output corresponding electric voltage and a charging control signal to said I/O interface;

an infrared receiving unit receiving infrared signals transmitted from said signal transmitting unit housed inside of said wired or wireless remote controller and decoding the same for the use of said rear connected chief receiving control unit (said infrared receiving unit being also used only for receiving infrared signals and decoding the same for the use of a rear end);

wired or wireless controller and decoding the same for the use of a rear end of said chief

receiving control unit (said infrared receiving unit can be simply a receiver of infrared signals and said decoding operation can be performed by a rear end unit);

a dual tone multiple frequency generator (DTMF) being subject to control of said chief receiving control unit to generate acoustic frequency control signals for dialing, (standing for keys, such as 0-9, *, #, ...and etc.), to substitute input phone numbers transmitted via a dialing keys of a cellular phone;

a communication detecting unit receiving communication signals of said I/O interface and outputting signals to said chief receiving control unit to make the same aware of a current status of a cellular phone;

a first connection unit being a plugging hole or a flexible signal cord for connection to a hand-free device, it usually being a coupling socket or connection cord of said hand-free set for use in connection to a cellular phone whereby signals of said receiver can be transmitted to said hand-free set by said first connection unit or signals of said hand-free device can be input to said receiver by said first connection unit;

a second connection unit being a plugging hole or a flexible signal cord for connection of said receiver to said I/O interface so as to permit signals to be transmitted between said receiver and said I/O interface; moreover, said second connection unit being removed and respective signal cords of said I/O interface being directly coupled to corresponding lines of said receiver.

4. The phone secretarial function extension device for a hand-free set as claimed in claim 1

wherein said I/O interface comprises:

a voice signal output line having one end output from said receiver and the other end thereof coupled to an input end of a signal terminal of a cellular phone, with a compatible amplifier and a capacitor (or resistor) serially connected thereto;

a voice signal input line having one end output via a receiving system and the opposite end coupled to an input terminal of a signal terminal of a cellular phone being provided with a serially connected compatible amplifier and a capacitor(or a resistor);

a charging line having one end coupled to said receiver at one end and connected to a charging terminal of a signal terminal of a cellular phone being equipped with a charging control circuit to control the activation and output voltages of said charging line;

a charging control line having one end coupled to said receiver and the opposite end connected to a charging terminal of a signal terminal of a cellular phone being provided with a charging control circuit thereon to control the activation of said charging line and output charging voltages thereof;

a dialing control line employed to transmit signals of said dialing control unit controlling said I/O interface chief control unit;

a common dialing signal line for transmitting signals of said dialing unit being connected to said dialing unit at one end and to an I/O interface chief control unit at another end;

a flagpole control line being employed to transmit flagpole signals to a multiplexer control unit to indicate if said I/O interface has been in connection to a cellular phone or not;

10004405 " 20501
T05021" 504400F

a cellular phone working synchronic signal input line used to transmit working synchronic signals of a cellular phone so as to permit said receiver to be in synchronic operation with said cellular phone; such a synchronic signal input line having one end coupled to said cellular phone and the other end connected to a chief control unit of said I/O interface;

a cellular phone analog signal input line being used to transmit from a chief control unit dialing and control digital data input into and output from said cellular phone;

said chief control unit transmitting various digital signal codes of control and dialing signals via said signal input line to said cellular phone and receiving and processing various signals from said receiver.

5. The phone secretarial function extension device for a hand-free set as claimed in claim 1 wherein said I/O interface comprises:

a voice signal output line having one end input via a receiving system and coupled to an output terminal of a signal of a cellular phone is serially connected to an amplifier and a capacitor (or resistor);

a voice signal input line having one end output via a receiving system and the opposite end coupled to an input terminal of a signal terminal of a cellular phone is provided with a serially connected amplifier and a capacitor(or a resistor);

a charging line having one end coupled to a receiving system at one end and connected to a charging terminal of a signal terminal of a cellular phone is equipped with a charging control circuit to control the activation and output voltages of said charging line;

10004405-120501

a charging control line having one end coupled to said receiver and the opposite end connected to a charging terminal of a signal terminal of a cellular phone is provided with a charging control circuit thereon to control the activation of said charging line and output charging voltages thereof;

a dialing control line employed to transmit signals of said dialing control unit controls said I/O interface chief control unit;

a common dialing signal line for transmitting signals of said dialing unit being connected to said dialing unit at one end and to an I/O interface chief control unit at another end;

a flagpole control line being employed to transmit flagpole signals to said multiplexer control unit to indicate if said I/O interface has been in connection to a cellular phone or not;

a cellular phone signal input line being employed to transmit control signals of a cellular phone and said I/O chief control unit and input/output signals of communication; and a programmable logic IC is disposed thereon;

said chief control unit being activated by signals transmitted from said cellular phone signal input line and transmitting a control signal indicating if said I/O interface is operating or not to a rear terminal of a receiving system;

a programmable logic IC being used to get input and output data coded;

a shift temporary register being employed to store coded data in said programmable logic IC and a conversion unit;

an AD conversion unit being used for converting input signals (digital signals into analog

signals and analog signals into digital signals) into signal mode available at rear terminals;

a shift control line being used for a cellular phone to input control signals.